

In the Claims:

1. **(Withdrawn)** A method of stimulating a population of undifferentiated mesodermally derived cells to undergo at least one of hematopoiesis and vascular growth; comprising:
  - (a) selecting a compound that is functionally equivalent to a gene product expressed in an embryo's extraembryonic tissue;
  - (b) causing the compound to access the cells, so as to stimulate the cells to undergo at least one hematopoiesis and vascular growth.
2. **(Withdrawn)** A method according to claim 1, wherein the compound is a secreted protein.
3. **(Withdrawn)** A method according to claim 1, wherein the compound is a hedgehog compound.
4. **(Withdrawn)** A method according to claim 3, wherein the compound is an agonist of a hedgehog protein binding receptor.
5. **(Withdrawn)** A method according to claim 4, wherein the hedgehog protein binding receptor is patched.
6. **(Withdrawn)** A method according to claim 1, wherein the compound causes enriched expression of Gli.
7. **(Withdrawn)** A method according to claim 3, wherein the hedgehog compound is selected from the group consisting of Indian hedgehog, Desert hedgehog and Sonic hedgehog compound.
8. **(Withdrawn)** A method according to claim 3, wherein the compound is an Indian hedgehog compound,
9. **(Withdrawn)** A method according to claim 1, wherein the compound is a first compound

derived from a first gene product and is capable of acting synergistically with a second compound that is derived from a second gene product expressed in the extraembryonic tissue, so as to enhance the stimulation of at least one of hematopoiesis and vascular growth.

10. **(Withdrawn)** A method according to claim 9, wherein the second compound is a functional equivalent of a TGF $\beta$  family member.

11. **(Withdrawn)** A method according to claim 9, wherein the TGF $\beta$  is selected from the group consisting of BMP-2, BMP-4, BMP-6 and BMP-7.

12. **(Withdrawn)** A method according to claim 1, wherein the extraembryonic tissue is visceral endoderm.

13. **(Withdrawn)** A method according to claim 1, wherein the extraembryonic tissue is yolk sac mesoderm.

14. **(Withdrawn)** A method according to claim 1, further comprising the step of maintaining the cell population in vitro in a culture medium such that step (b) includes providing the compound in the culture medium.

15. **(Withdrawn)** A method according to claim 14, wherein the cells are a population of hematopoietic stem cells.

16. **(Withdrawn)** A method according to claim 15, wherein the hematopoietic stem cells are selected from the group consisting of cord blood cells, fetal peripheral blood cells and fetal liver cells.

17. **(Withdrawn)** A method according to claim 15, wherein the hematopoietic stem cells are adult bone marrow cells.

18. **(Withdrawn)** A method according to claim 14, wherein the cells are progenitor cells

obtained from an adult human.

19. **(Withdrawn)** A method according to claim 14, wherein the cells are precursor cells from an adult human capable of vascular growth when stimulated by the compound.

20. **(Withdrawn)** A method according to claim 14, wherein the cells constitute embryonic tissue.

21. **(Withdrawn)** A method according to claim 20, wherein the cells constitute an embryonic explant culture.

22. **(Withdrawn)** A method according to claim 21, wherein the embryonic explant culture is a blastocyst.

23. **(Withdrawn)** A method according to claim 1, wherein the cells are in vivo hematopoietic stem cells within the bone marrow of an animal.

24. **(Withdrawn)** A method according to claim 1, wherein the cells are hematopoietic stem cells present in the animal and are selected from the group of hematopoietic cells found in at least one of bone marrow, cord blood cells, fetal peripheral blood cells and fetal liver cells.

25. **(Withdrawn)** A method according to claim 24, further comprising causing the compound to access the stem cells, by administering an effective dose of the compound to the animal by any of oral, intradermal, subcutaneous, transmucosal, intramuscular or intravenous routes.

26. **(Withdrawn)** A method according to claim 2, wherein the compound is functionally equivalent to a protein from the bone marrow morphogenic protein (BMP) family.

27. **(Withdrawn)** A method of treating developmental errors in vascular growth or hematopoiesis in an embryo in utero, comprising:

(a) selecting an effective dose of a compound that is functionally equivalent to a gene product expressed in an extraembryonic tissue; and

(b) causing the compound to access a population of embryonic cells in vivo, so as to stimulate the cells to undergo at least one of hematopoiesis and vascular growth.

28. **(Withdrawn)** A method according to claim 27, wherein the compound is an agonist of a hedgehog protein-receptor.

29. **(Withdrawn)** A method according to claim 27, wherein the compound is a hedgehog protein.

30. **(Withdrawn)** A method according to claim 27, wherein the compound is a first compound capable of acting synergistically with a second compound that is derived from a second gene product expressed in the extraembryonic tissue, so as to enhance the stimulation of hematopoiesis in embryonic cells.

31. **(Withdrawn)** A method of treating a subject suffering from an abnormal number of erythroid cells, comprising:

(a) selecting an effective dose of a compound that is functionally equivalent to a gene product expressed in an extraembryonic tissue; and

(b) causing the compound to access a population of hematopoietic stem cells over an effective time so as to modulate the number of cells undergoing at least one of proliferation or hematopoiesis.

32. **(Withdrawn)** A method according to claim 31, wherein the compound is an agonist of a hedgehog protein-receptor and the hematopoietic stem cells are stimulated to undergo one of proliferation or hematopoiesis.

33. **(Withdrawn)** A method according to claim 32, wherein the compound is a hedgehog protein.

34. **(Withdrawn)** A method according to claim 31, wherein the compound is a first compound capable of acting synergistically with a second compound that is derived from a second gene product expressed in the extraembryonic tissue, so as to enhance the stimulation of hematopoiesis in hematopoietic stem cells.
35. **(Withdrawn)** A method according to claim 31, wherein the compound is an antagonist of a hedgehog protein and the hematopoietic stem cells are inhibited from undergoing one of proliferation or hematopoiesis.
36. **(Withdrawn)** A method according to claim 31, wherein the abnormal number of erythroid cells is an abnormally low number of erythroid cells characterized by an anemia in the subject, the anemia being selected from the group consisting of idiopathic aplastic anemia, constitutional aplastic anemia, secondary forms of aplastic anemia, myelodysplastic anemic, viral induced chronic anemia, chronic inflammatory disease induced anemia, cancer induced anemia, chronic anemia induced by organ failure, thrombocytopenia and drug induced anemia.
37. **(Withdrawn)** A method according to claim 31, wherein the abnormal number of erythroid cells causes a disease selected from the group consisting of polycythemia vera and erythroleukemia.
38. **(Withdrawn)** A method of treating a subject suffering from an ischemia in tissues, comprising:
- (a) selecting an effective dose of a compound that is functionally equivalent to a gene product expressed in an extraembryonic tissue; and
  - (b) administering the compound to the ischemic site over an effective time so as to stimulate vascular growth within the ischemic tissues.
39. **(Withdrawn)** A method according to claim 37, wherein the ischemia is myocardial ischemia.
40. **(Withdrawn)** A method according to claim 38, wherein the compound is an agonist of a

hedgehog protein-receptor.

41. **(Withdrawn)** A method according to claim 40, wherein the compound is a hedgehog protein.

42. **(Withdrawn)** A method according to claim 39, wherein the compound is a first compound that is capable of acting synergistically with a second compound that is derived from a second gene product expressed in the extraembryonic tissue, so as to enhance the stimulation of vascular growth.

43. **(Currently amended)** A method of inhibiting ~~treating~~ abnormally enhanced vascular growth in a subject, comprising:

(a) selecting an effective dose of a hedgehog compound, which hedgehog compound is a hedgehog antagonist capable of inhibiting hedgehog signaling ~~the activity of a gene product expressed in an extraembryonic tissue~~; and

(b) administering the compound to the subject over an effective time so as to inhibit abnormally enhanced vascular growth.

44-56. **(Cancelled)**

57. **(New)** The method of claim 43, wherein the hedgehog compound is a hedgehog antibody.

58. **(New)** The method of claim 43, wherein the method comprises a method of inhibiting angiogenesis in a subject and wherein the hedgehog compound is administered in an effective dose and for an effective time to inhibit angiogenesis.

59. **(New)** The method of claim 57, wherein the method comprises a method of inhibiting angiogenesis in a subject and wherein the hedgehog compound is administered in an effective dose and for an effective time to inhibit angiogenesis.

60. (New) The method of claim 43, wherein the enhanced vascular growth accompanies a solid tumor, and the method comprises a method for treating the solid tumor.

61. (New) The method of claim 43, wherein the enhanced vascular growth accompanies ocular neovascularization associated with diabetes, and the method comprises a method for treating the ocular neovascularization associated with diabetes.

62. (New) The method of claim 57, wherein the enhanced vascular growth accompanies a solid tumor, and the method comprises a method for treating the solid tumor.

63. (New) The method of claim 59, wherein the enhanced vascular growth accompanies a solid tumor, and the method comprises a method for treating the solid tumor.

64. (New) A method of inhibiting abnormally enhanced vascular growth in an animal, comprising administering to the animal means for inhibiting hedgehog signaling in an amount effective to inhibit abnormally enhanced vascular growth.

65. (New) The method of claim 64, wherein the method comprises a method of inhibiting angiogenesis in a subject and wherein the means for inhibiting hedgehog signaling is effective to inhibit angiogenesis.

66. (New) The method of claim 64, wherein the enhanced vascular growth accompanies a solid tumor, and the method comprises a method for treating the solid tumor.

67. (New) The method of claim 64, wherein the enhanced vascular growth accompanies ocular neovascularization associated with diabetes, and the method comprises a method for treating the ocular neovascularization associated with diabetes.

68. (New) The method of claim 65, wherein the enhanced vascular growth accompanies a solid tumor, and the method comprises a method for treating the solid tumor.